Student learning sheet

Investigating speed and acceleration

Name: _____Class: _____

Introduction

Every day, we are surrounded by many types of motions. Several means of transportation are available for people to travel from one place to another: airplane, train, bus, car, or bike. These tasks aim to investigate the relationships between the qualities of a motion by interactive simulations.

To access the simulations with this link or scan QR code above.

Activity 1. Observe motions around you, which is the fastest one among them? How would you describe this one is faster than the other?

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Activity 2. Relationships between distance and time, between velocity and time of Motion 1

- Your predictions:

Is there any relationship between distance and time? In what way does it relate to one another?

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Is there any relationship between velocity and time? What is its relationship like?

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- Assess the online simulation (link) and conduct an experiment with the Motion 1 (click on “Motion 1”).

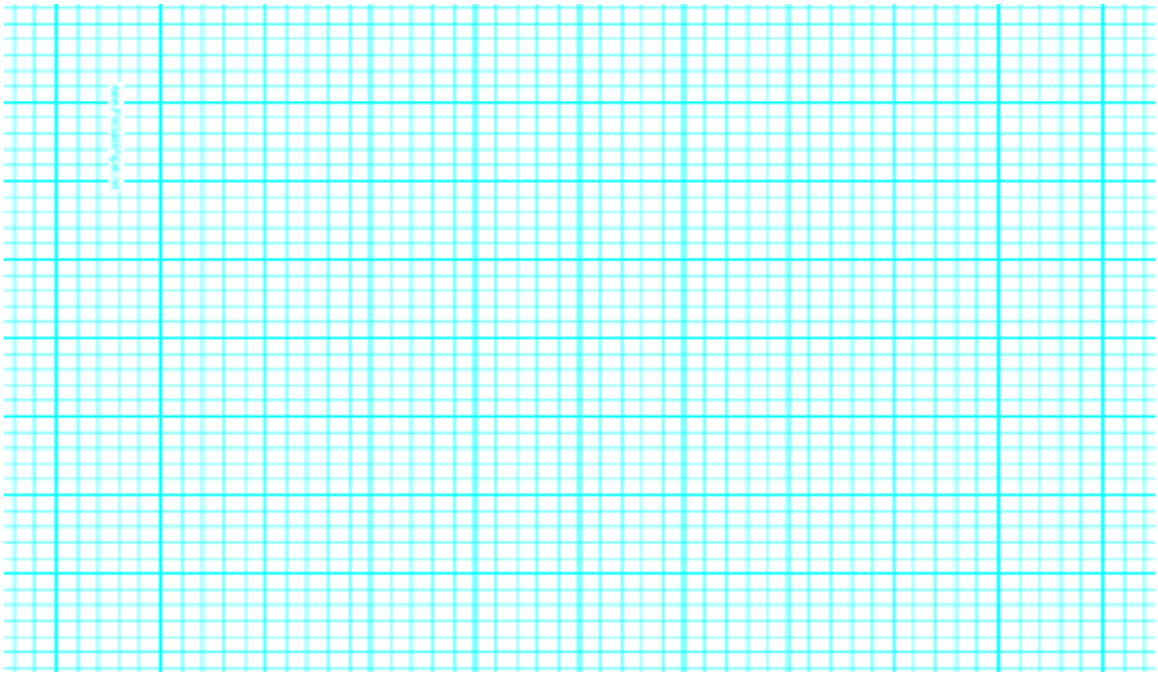
- Observe the motion and read the time, speed and measure by conducting an experiment with the simulation. Complete the table data:

Table 1. Data set of Motion 1

Distance (m)					
Time (s)					
Velocity (m/s)					

- Based on the data table, draw a graph to illustrate the relationship between Distance (y-axis) and time (x-axis).
- Examine the plotted points on the graph paper.

Fig. 1. The distance-time graph of Motion 1



From the graph, which line shapes can you include? How does distance and time relate?

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Calculate the acceleration of this motion

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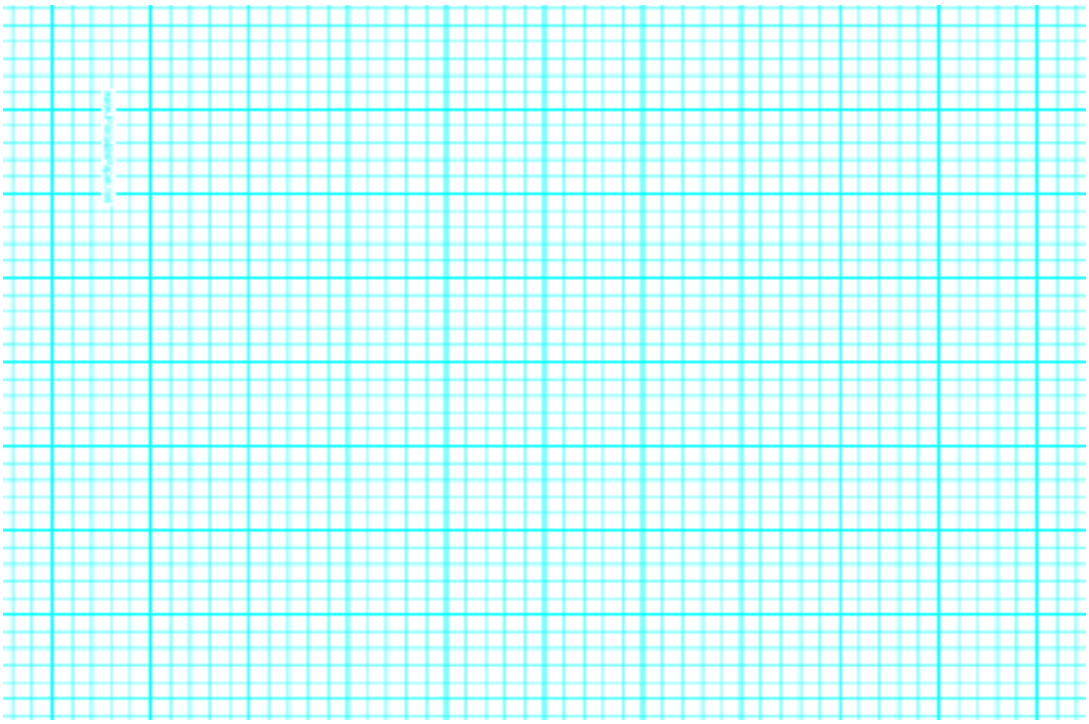
Fig. 2. The velocity-time graph of Motion 1



Which line shapes can you include from the graph? What is conclusion about the relationship between velocity and time

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Activity 3. Relationships between distance and time, between velocity and time of Motion 2 (*Note: This anticity can be applied as a homework for student*)

- Your predictions:

Is there any relationship between distance and time? In what way does it relate to one another?

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Is there any relationship between velocity and time? What is the relationship between them?

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- Access the simulation and conduct an experiment with the Motion 2 (click on "Motion 2").

- Observe the motion and read the time, speed and measure distance in the simulative space. Complete the table data:

Table 3. Data set of Motion 2

Distance (m)					
Time (s)					
Velocity (m/s)					

- Draw a graph to illustrate the relationship between Distance (y-axis) and time (x-axis).
- Examine the plotted points on the graph paper. Is there any line shape in the graph that can be included? In conclusion, what is the relationship between distance and time?

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Fig. 3. The distance-time graph of Motion 2

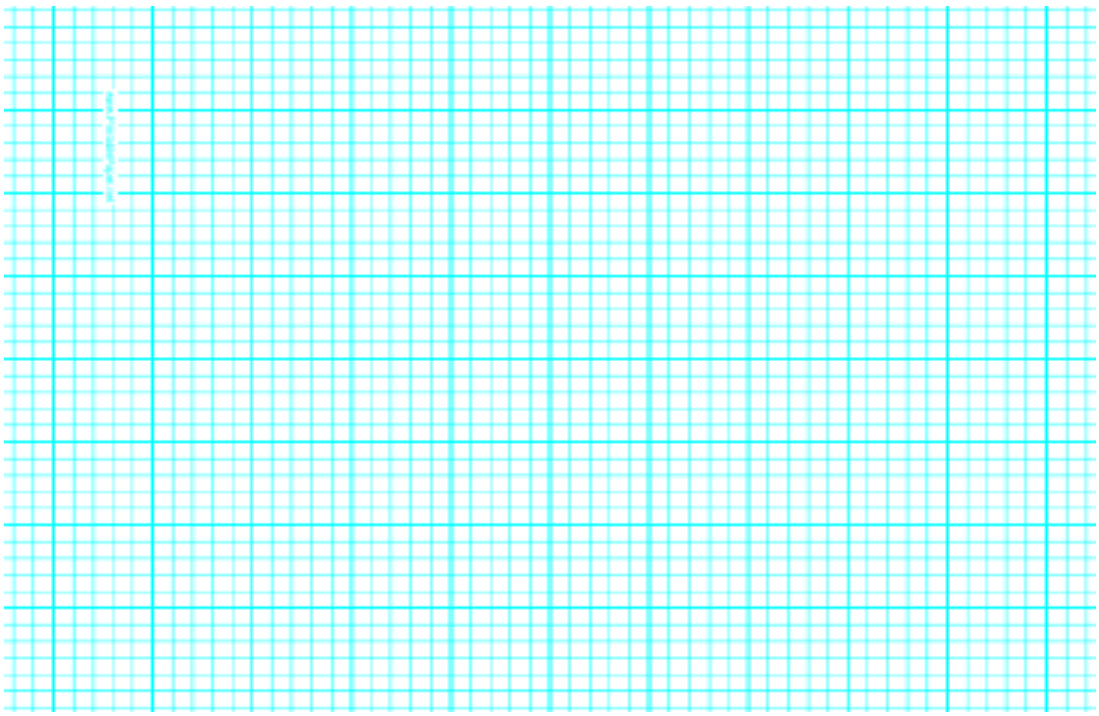
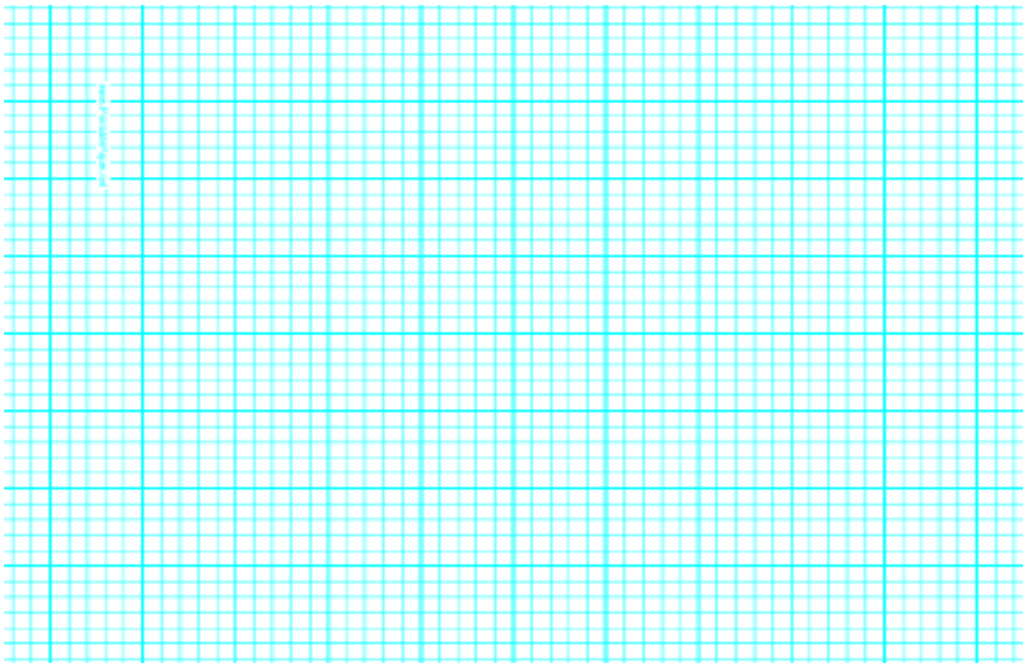


Fig. 4. The velocity-time graph of Motion 2



Which line shapes can you include from the graph? How does velocity relate to time?

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Calculate the acceleration of this motion

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